DOCUMENT RESUME

ED 185 606 CS 502 856

AUTHOR Bell, Daniel
TITLE The Matching of Scales.
INSTITUTION International Inst. of Communications, London (England).
PUB DATE 79
NOTE 21p.: The Louis G. Cowan Lecture given during the Annual Conference of the International Institute of Communications (London, England, September 12, 1979).
AVAILABLE FROM International Institute of Communications, Tavistock House East, Tavistock Sq., London WC1H 9LG, England

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Change Agents: *Communication (Thought Transfer); *Communication Problems; *Communications; *Communication Skills; Information Theory; *Interaction; *Mass Media; Social Change; Social Values; Telecommunications

ABSTRACT

This essay argues that communication is at the intersection of four social changes that may in their effects add up to a third sociotechnological revolution. The four changes posited are: a historic shift in the character of infrastructures; a new emphasis on visual modes in the coding of images and ideas; a change in the nature of technology, from "thing" to "concepts"; and a new socio-organizational framework (called either compunications or telematique) to unify the diverse changes from teletext to teleprocessing. The essay suggests that for society, the major problem is the change of the scale in which social interactions take place. It notes that the widening of the arena brings people and exchanges (economic and political) into closer and more rapid contact, increasing the volatility of our problems. It also suggests that the idea that scales can be reduced is seductive, but has snares. In dealing with these issues, the essay begins with a discussion of scale in the rustic setting. It then moves on to how Lord Birkenhead sought 50 years ago to forecast the future but failed to anticipate communications. It then discusses the character of the new "revolutions" in communication and concludes with a discussion of the matching of scales as the maicr sociological issue for the democratic policy. (Author/FL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED185606

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

The Louis G Cowan Lecture
1979

Daniel Bell

The Matching of Scales

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY
International Institute of Communications
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CS502856

International Institute of Communications

© 1979 International Institute of Communications
ISBN: 0 904776 11 5
Published by the International Institute of Communications,
Tavistock House East, Tavistock Square, London WC1H 9LG.
Printed by Reproworkshop Ltd, 7-11 French Place, London E1.

The International Institute of Communications provides a forum for the discussion of communication policies and issues. It is concerned with the cultural, social, economic, political and legal aspects of communications, both now and in the future. Its work is global and multidisciplinary and involves politicians and policy-makers, executives, broadcasters, journalists, industrialists, engineers, lawyers and academics. It holds seminars and conferences, organises international and national research projects and has a library and publications programme. Its journal *InterMedia* provides news and comment on communications issues around the world.

In 1977 the IIC founded the Louis G. Cowan Lecture in honour of one of its first and most energetic Trustees. Louis G. Cowan was born in Chicago in 1909 and died in New York in November, 1976. In the 1940s and 1950s he created several innovative radio and TV shows including *The Quiz Kids, Stop the Music, Hollywood Calling, Captain Kangaroo* and *The $64,000 Question.* In 1955, he was appointed Vice President, Creative Services, CBS Inc., and in 1958, President, CBS Television Network. In 1961 he became Director of the Mass Communication Research Center at Brandeis University and started his own publishing company, Chilmark Press. From 1965-76 he was Director of Special Programmes at the Graduate School of Journalism, Columbia University. He was Chairman of the Publishing Board of *Partisan Review* and Chairman of the Publications Committee of the *Columbia Journalism Review.*

Previous Louis G. Cowan Lectures:

1977 Harold Lasswell: *Communication in a divided world: opportunities and constraints,* given at Washington, DC, USA.

1978 Soedjatmoko: *The future and the learning capacity of nations: the role of communications,* given at Dubrovnik, Yugoslavia.

The 1979 Louis G. Cowan Lecture was given by Professor Daniel Bell on 12th September 1979, at the Café Royal, London, during the tenth Annual Conference of the International Institute of Communications.

Daniel Bell was born in New York City in 1919. He studied at the City College of New York and gained a Ph.D. from Columbia University where he later became Professor of Sociology after a career as editor and publisher. He is currently Professor of Sociology at Harvard University.

He has been a member of the President's Commision on Technology (1966), Chairman of the Commission on the Year 2000 (1966-74) and US representative of the Advisory Committee of the OECD project, 'Inter Futures', (1977-79).

His many books and essays include *'The End of Ideology', The Coming of the Post-Industrial Society', 'The Cultural Contradictions of Capitalism', 'Teletext and Technology'* and *'The Return of the Sacred'.*

Other lectures given by Professor Bell are the 1977 Hobhouse Lecture, the 1977 J. Robert Oppenheimer Lecture and a presentation at the 1979 Einstein Centennial Symposium.

Abstract

Modern communications are at the intersect of four major social changes: an historic shift in the character of infrastructures; a new emphasis on visual modes in the coding of images and ideas; a change in the nature of technology, from 'thing' to 'concepts', (miniaturisation is a prime example), and a new socio-organisational framework (called either compunications or télématique) to unify the diverse changes from teletext to teleprocessing.

For society, the major problem is the change of the scale in which social interactions take place. The widening of the arenas brings people and exchanges (economic and political) into closer and more rapid contact with one another, increasing the volatility of our problems. The idea that scales can be reduced ('small is beautiful') is seductive, but has its own snares.

In dealing with these questions, the essay begins (after a tribute to Louis Cowan, a founder of the IIC) with a discussion of scale in the rustic setting. It then moves on to how a prescient mind, Lord Birkenhead, fifty years ago sought to forecast the future but failed to anticipate communications; discusses the character of the new 'revolutions' in communication, and concludes with a discussion of the matching of scales (i.e. the adjustment of institutions) as the major sociological issue for the democratic polity.

The matching of scales

I am pleased to begin with a tribute to Louis Cowan. Louis Cowan and I were colleagues when I taught at Columbia University. He came to the academic world after 20 years in radio and television, serving at the end of his career as President of the CBS Television Network. Unlike many who have left business, he never despised commerce. The reason was that he was at heart an entrepreneur, a rare entrepreneur of ideas and institutions. In the 15 years that he worked in the university he helped build a number of institutions, including the IIC.

Louis Cowan and I were also neighbours. We both had summer houses on Martha's Vineyard, an island off Cape Cod. Louis lived in Menemsha, I lived in Chilmark. Both are called towns by courtesy. Menemsha is simply a break in the coastline which allows a number of fishing boats to make port there. Chilmark is a crossroad parted by a town hall and a library and a fire station. Being academics we had the privilege of spending entire summers there and as friends we would take long walks.

Chilmark gives me an anchorage for my theme, which is the problem of scale. I learned two lessons from living in Chilmark for more than twenty summers. One is what I would call the fragility of silence. Louis and I would tramp through the woods, taking great joy in coming unexpectedly across a winding brook, or catching sight of a deer, yet suddenly that silence would be broken by loud voices or a transistorised radio — I don't know whoever said that miniaturisation was always a blessing — and we realised to our dismay that these sounds were not really close by, but half a mile away, even a mile away, and given the declivities of the island would reach us almost in direct echo. So one thing I learned from the Vineyard is that we need some time, not for communication, but for silence; and silence itself is very fragile. Where does one retreat? Are there any retreats left? This problem is also one of scale.

The second thing I learned on the Vineyard is what might be called the vicissitudes of democracy. The enduring tradition of New England, and one which is held tenaciously in Martha's Vineyard, is that of the town meeting. All local questions are settled by direct democracy, not by council-men or representatives. On insular matters, not interests but lineage divides the people. Clan groups which are knotted by marriage vote as clan, viz-a-viz one another.

And historical demography provides the only clue as to where the power and privileges divide. But on other matters, it is always the natives versus the summer people. In one instance in Menemsha, the local fishermen wanted to build an asphalt road across the Wetlands, those fragile dunes on the wild side of Menemsha pond, because they were tired of tying up their boats on one side of the pond, and having to drive ten miles on a long, curving road, to their homes up-island. Only a few persons would be helped by this action, and some fragile marshlands and nesting places of wild gulls would be destroyed. Louis's home was sited nearby and he was very much involved. Direct democracy triumphed. After all, summer people cannot vote and the road was built and with it came the realisation of many of our fears. So small is not always beautiful. Small can be reckless. At least tired men earning a living take precedence over gulls, unspoiled nature and views enjoyed by the summer people.

I've concentrated at one end of the scale. A little hamlet and two things which I learned there. Having spoken about one end of the scale, the social microcosm, let me turn to the other, the macrocosm. And on the flickering screen of futurity sketch some difficult problems of scale and particularly the problems created by the new centric forces, centrifugal and centripetal, in our age of communications.

Before leaping forward, it is always useful to take a step back. It is a necessary lesson in humility. So I go back fifty years to an interesting English mind who had looked forward a hundred years. Being almost halfway to the world of 2030, which is the title of a book by the Earl of Birkenhead, such a perspective allows us to see what was foreseen and what was not — particularly about communications.

In 1930, at the close of his life, the first Earl of Birkenhead, the former F.E.Smith, the great lawyer and great political figure who was called one of the first-class brains of Britain, wrote a prophetic book with the title, *The World in 2030.* Along with Lloyd George and Winston Churchill, the Earl of Birkenhead had been one of the dominant figures in English post-war politics.*

*What impelled him to write his book is not clear. There had been in the Twenties and Thirties a small series of some fifty books called *The World of Today and Tomorrow*, including one by J.B.S. Haldane on the future of biology, itself quite prophetic; a book

Birkenhead, writing in 1930, begins with energy resources. He says, 'Locked up in the atoms which constitute a pound of water is an amount of energy equivalent to ten million horsepower and the best scientific opinion believes that before 2030 physicists will have solved the problem of supplying the world with limitless amounts of cheap power.' Well, it is still scientifically possible, and still a dream. And then he says, as his imagination soars, it would be possible even to alter radically the geography and climate of the world, by utilising some fifty thousand tons of water, the amount displaced by a large liner. It would even be possible to remove Ireland to the deeper portions of the Atlantic Ocean. That was a mixture of wish-fulfillment and technology!

The liberation of energy, he says, will revolutionise travel and transport. The future belongs to the airplane. And he says, although flying still remains in its infancy, that the future can already be roughly determined because the future developments of the combustion engine driven by petrol is fairly well known. Daily airplane travel between continental capitals will be commonplace. The major remaining problem, the bulky and weighty supplies of fuel, limits the distance of air travel. Therefore, he says, 'concerning an Atlantic air ferry, I remain skeptical.' It could be accomplished either by means of landing stations in mid-ocean or by following a trans-Artic route.

The problem of nationalism, Birkenhead continued, is the most important with which statesmen of the future must deal. By the year 2030 it will have been solved satisfactorily, or it will have destroyed our present civilisation. The model for the future will be the British Empire, because its constitution is the most utilitarian and practical form of government so far evolved by human ingenuity. Well, again, it is an open question whether this still remains true.

Then he says (given the nature of the way Britain looks at the imperial world) the danger is China. One baby in every four born into the world looks up into the eyes of a Chinese mother. China involved in the hopeless ferment of filibustering warlords and new ideas is still

---

on the future of mechanical man, H. Stafford Hatfield, which is quite striking with its notions of automation; even a book called *The Future of Swearing* by Robert Graves, which is, I suppose, a good Graves topic. To some extent Birkenhead had scavenged these books, so much so that he was accused of plagiarism. I'll leave that aside and simply say that he had taken from what had been the best of the thought of his time.

helpless and distracted. And yet there are two possibilities — and here he almost becomes Hegelian — to put China squarely in the centre of history. One is the practical genius of the Chinese. In business they far outstrip their more obviously agile competitors, the Japanese; in their laborious attention to detail, they challenge the Germans; in sheer powers of endurance they surpass all men. He says secondly that China will see a world historical figure. A Napoleon, a Bismarck or a Cavour is needed to transform the seeming chaos of China into a formidable menace to the world. If China's Napoleon had such intentions he would build a mighty industrial empire, and China could undersell every industrial competitor in the markets of the world and throw the finances and prosperity of Europe into bankrupt confusion. If he was a soldier, he could command the war material necessary for great modern campaigns; his armies might well overrun Asia and possibly parts of Europe. Here you have the Mongol invasion feared again.

I've been hop-skipping and jumping through the vagaries of the Earl of Birkenhead. What is quite striking is that even though Birkenhead was astute — to begin with, his stress on energy and resources, which are the foundation of an industrial civilisation, was acute — in many ways his sense of technology was fairly limited. Perhaps most striking is the minor attention, if any, that is given to the idea of communication. There is a passing mention of television, which had been invented four or so years before. He says it may well be that because of television it should be possible for anyone, no matter how distant they are, to see events immediately in their homes. Such developments may influence the future of politics. Their aid will be feasible, even more, to revive through television that form of democracy which flourished in the city state of Ancient Greece.

If I make my own judgment, Birkenhead was weak in technology, which may be a reflection of some aspects of British life, and strong in his judgments of character, which perhaps is a strength of the British view of politics. But the most startling omission, as we would look at it today, is this almost singular lack of attention, other than a page of reference which deals only with a gadget, with television, to the problem of communication.

One of the most striking things about *The World in 2030* and similar books, going back to Huxley's *Brave New World* which was written about five or six years before, is that most of the futuristic predictions written at the time deal with things, events, gadgets. Their

authors lack the ability to conceptualise, the ability to take disparate kinds of things and look at them in new frameworks, in new perspectives. Yet it seems to me that if one is to think intelligently about communications, it makes little sense to think in terms of gadgets, no matter how important they are, whether it be a television or Prestel, or any of the more esoteric elements such as optical fibres. We must try to think in terms of how one can bring all these matters together in some intellectual coherence, in some intellectual framework, that allows one to think of society not in terms of gadgets, because it is not gadgets which will change a society, but modes of thought.

Let me turn to the first of two major themes that I want to talk about; the question of how one can conceptualise or, at least, propose some kind of conceptualisation, about communication and the impacts it will be having on a society.

I begin, in a hesitant way, by saying that communication today is at the intersection of four converging social changes which may, in their effects, add up to a third socio-technological revolution.

One tends to shy away from the word revolution. Sometimes one is gun shy for political reasons. Sometimes the reasons are intellectual. The word has been cheapened by journalists and radical students so that one is dulled into a stupor with every change being called a revolution.

We know that those who were living through the industrial revolution never knew were living through such a revolution; never knew that they had been, so to speak, in the eye of the hurricane. It wasn't until the 1880s that Arnold Toynbee, the father of the great historian, in giving a set of lectures, coined the term the industrial revolution. Looking back a hundred years, he said, it might be striking to realise we have been living through an industrial revolution.

One of the reasons why people did not know that they were living through an industrial revolution is that nobody had voted for it. No votes had been taken. An industrial revolution or a social revolution differs from a political revolution because political revolutions are made loudly and noisily, with a dramatic thump, by guns and by running feet. But the industrial revolution was a process and processes are hard to date and, even though one may point to James Watt and

the invention of the steam engine as a symbolic fact, the diffusion times of innovations and change are long and irregular.

Today we are so much on the *qui vive* that any technological gadget is hailed as creating a revolution. If one were to read the technological journals of thirty years ago one would find the hailing of a new revolution call Fractional Horsepower. The articles were full of the marvels of fractional horsepower: how it would give us tools to lighten all our burdens and relieve us of all our worries. All the power of industry would now be placed at the disposal of the home. Fractional horsepower has come. And we now have electric toothbrushes and electric carving knives, all with these little quotas of fractional horsepower. Yet we still have our aches and pains, and I'm not sure we've lived through a revolution. I do not mean to minimise the real effects of such a change, particularly in the introduction of power tools such as portable saws and drills and screwdrivers and power lawnmowers, and the gains of productivity from these; but one has to see the effects in proportion. Technology does not change a society by the flick of a switch, even when the effects become quite pervasive, for the simple reason that the replacement funds and the diffusion rates are constrained, by cost as well as custom.

Having introduced these cautions let me now indicate the nature of these four convergences that might, even now, constitute a socio-technological revolution. The first major change, which is already taking place, is a change in infrastructure. Every society is tied together by three different kinds of infrastructures. One is transportation. The second is the energy grids. And the third is communication.

Transportation is the network of old caravan trails, trade routes, the forms of economic exchange; it is the oldest way in which people were tied together and still are. River valley civilisations are shaped by transportation. The location of cities, particularly in industrial ages, is dictated by this infrastructure, so that one finds, until recently, that every major city in the world is located on water, either on a river or an ocean or sea, because water transportation is the easiest way to move bulk goods.

The second set of infrastructures are the energy grids, the oil pipelines and such; again, society are tied together in this way. The third is communication; originally the postal systems, then the telegraph and the telephone and now, of course, a huge panoply of new communication devices.

What infrastructures do, fundamentally, is provide the basis for

interdependence. But the kinds of interdependence created by communication radically differs from the kinds of interdependence created by transportation and by energy grids. So if one is trying to find a way of putting together the diverse impacts of communication, one has to look at the changing modalities of infrastructure (a topic which deserves a large degree of elaboration, to trace out its effects).

The second of my major changes are in what I simply call the coding of image and idea. There have been, one can say, four major changes in human civilisation in the way images and ideas are coded. The first, and the oldest, whose origins in the past we have no way of knowing, is speech. Through phonemes and morphemes we have a coding of sound to convey messages. Next, going back only a few thousand years, is writing. The cuneiforms, hierogliphs and eventually the alphabet were a way of putting scratchmarks on clay, parchment and paper to allow for communication; at first to record commercial transactions, and later for ideas. Some people consider writing to be a loss. Plato, in the *Meno*, decries writing, because writing reduces attention and, therefore, thought, that degree of intelligence which is linked to memory. We know that the Ancients were capable of enormous feats of memory. They could recite whole books and pull together, out of memory, new connections of ideas. Writing is a lazy way, of conserving memory and so was dreaded by some people. Not every advance, even something like writing, is always hailed as a positive act. But, by and large, we would have to say that writing is a second major advance.

The third advance, of course, is printing, which is itself, as much as writing, the coding of images and words through relief processes, through woodcuts and then through mechanical type and the high speed presses which allow for the vast dissemination of messages, of materials, of books and ideas. The fourth major advance is video; photography, film, television and such. The emphasis is more on the image rather than simply on the idea *per se;* although, of course, ideas get conveyed.

What these different elements of speech, writing, printing and now video can do is not only spread ideas but reinforce emotional impact. Probably one of the most extraordinary events in American history was the funeral of John F. Kennedy. On the last day, as the cortège wound its way to Washington, 93 per cent of all television sets in the country were focused on the train as it moved (as the Lincoln train once had moved, but at a very different pace) to its last stop.

The third component is technology. In many respects the most fundamental change in modern technology is not the introduction of any gadget at all but the concept of miniaturisation; the possibility that one can take huge things and compress them. I suppose the most recent miracle of miniaturisation was the biological laboratory only one cubic foot in size, which was sent to Mars in the Voyager spacecraft. On a signal an arm went out and pulled up material from the surface of Mars and then, on a further signal, another device chemically analysed the material to see if it contained evidence of life. The search was highly symbolic because Auguste Comte, who was the founder of sociology, said in the *Cours de Positive Philosophie,* the last synoptic effort to bring all knowledge together, that the two unknowable facts which man would not be able to solve were the composition of the distant stars, and whether there is life on Mars.

Ten years after Comte published his book, Gustav Kirchoff invented spectrum analysis and we began to know the composition of the different stars. Just three years ago we had the Voyager which was able to reach Mars and in a biological laboratory one cubic feet in dimension use coded signals to carry out extraordinarily precise tests to find out if there were life on Mars.

Miniaturisation not only produces that kind of miracle but also has obvious practical effects. One, in the realm of production and regulation, is the microprocessor. In the control of machine tools, as sensors in measuring units, etc., we know that the revolution in chips is going to alter fundamentally the production processes.

A second aspect of minaturisation is in transmission; for example, a change from analogue to digital signals; innovations such as optical fibres, which increase the capacity of communication links; and, finally, innovations such as super-conductivity and the Josephson circuit. These circuits are simply a way of freezing metals so as to avoid almost all friction, and therefore to allow electric impulses to go almost entirely at the speed of light; as a result computing speed rises from nanoseconds or billionths of a second to picoseconds which are trillionths of a second. This extraordinary change in technology, the spreading impact of miniaturisation, is evident on the production side, on the regulation side, and on the transmission side.

The fourth change is a change in the form of the social organisation of communication. It has been given several neologisms. My colleague Anthony Oettinger at Harvard calls it compunications, a mixture of computers and communications. Simon Nora and Alain Minc

in their report, *L'Informatisation de la Société*, have called it 'télématique'. I prefer the word 'télématique'. It is more euphonic and is more elegant than compunication; and it has the chachet of being French.

Télématique is essentially a unified system of differentiated elements. Networks of data processing systems, whether they be satellite or microwave or cable, tie into production units and banking units; information retrieval is possible through different computer banks and videotex services; all become linked together.

The configuration of these changes is one aspect of what I have called the post-industrial society. There are many different dimensions of a post-industrial society. One is a change in the economic sector, the crossover to a service society. In the United States today only 17 per cent of the labour force is engaged directly in production, and by the year 2000 it is quite likely that less than 10 per cent of the labour force will be industrial workers (fewer than 4 per cent of the American labour force is engaged directly in agriculture).

The second, more important, axial principle, is the codification of theoretical knowledge. Almost all these elements I have described, in some way or the other, have derived from theoretical knowledge. Einstein's paper on the photo-electric cell, about 65 years ago, was the foundation for the laser and the hologram, just as Maxwell's equations on electromagnetism undergirded much of the work of Hertz on radio waves. It is this codification of theoretical knowledge which now becomes the directive of change rather than simply becoming independent or an ally of change itself.

And thirdly there is a new intellectua technology. Technology is no longer 'things' or machines; it is a way of thinking. It can be algorithms, which are simply a set of decision rules, decision theory, systems analysis, operations research or various other modes. Together, they may up what I have called the new intellectual technology.

There is no single conceptual framework that derives from these elements. One draws a conceptual framework for a purpose at hand. The one which I drew, that of a post-industrial society, was an effort to look at the fundamental axes of change in the social structure of a society. It has less to do with some of the cultural impact of communication (which itself would be a very different kind of conceptual framework) or, directly, with politics. But what I have tried to do, even if only schematically, is to delineate the changes which form the basis of the new conceptual frameworks that we shall have to draw if we are to understand modern communications.

Let me return now to the theme which is the title of this lecture, which derives in one respect from my opening remarks about my strolls with Louis Cowan in the rustic areas of Martha's Vineyard.

The revolution in communication, which has tied together my four major changes, has two major sociological effects. One, which I shall only mention briefly, is the multiplicity in exponential number of interactions, transactions, exchanges, messages, news, economic transfers, etc. Out of this multiplicity we have the problem of overload, of sensory bombardment, of contagion effects in fashion, and in politics, and the scarcity of time — because one can't stock time the way one can stock goods. It may seem strange to talk about the scarcity of information but I use the word scarcity in an economic sense; namely, a situation which involves rising costs. Information becomes scarce, and more costly, in time and money because the problem of wending one's way through it or sifting it and, more importantly, of moving from the more technical dimensions to the more public consequences, involve new kinds of mediation, new forms of 'translation', whether it be the scientific journals such as *New Scientist* or *Scientific American*, or similar efforts. So in a curious way there are new scarcities. The nineteenth century thought that Utopia would come with the abundance of goods. We now see that in the 20th and 21st century there are new scarcities: the scarcity of time and the scarcity of information.

But all these elements, as I say, which involve the incredible multiplicity of interaction, transaction, etc., is a separate topic. One can do no worse than to go back to the work of Emile Durkheim, to the book he wrote in 1893, *The Division of Labour in Society*, which sketches out a model of what he calls structural differentiation to see what happens when one gets a multiplicity of exchanges and transactions between people.

The second theme, and the one to which I want to devote the rest of my time, involves what I would call the widening of arenas. What these revolutions in communication do is to break down segmentation and to pull people together into broader and broader units. In many cases we have now for the first time truly national societies. And we have for the first time the beginning of a truly international economy.

This event is unique in its historical setting because there are now new forces which are unifying larger and larger social units. In the past, the initiative for the unification of social units came either from religion (such as Christianity or Islam) or from political empires such

as Rome. Until the nineteenth century the major larger-scale units were political empires — the empires of China, of Alexander, of Rome, of Byzantium, the Arab empires, the Turkish empires, the Holy Roman Empire (which of course was neither holy nor Roman), the Spanish Empire and such. Politics was the main means of power and wealth through plunder, tax levies, and expropriation. The nineteenth century saw, for the first time, the unleashing of economics, or the separation of economics from politics. And we began to have for the first time an international economy without a congruent political entity to dominate it. There was the new idea of a peaceful interacting market which, through a rational division of labour, and comparative advantage, would allocate functions in a harmonious way. The early Free Traders, such as John Bright and Richard Cobden, the Manchester Liberals, felt that war was now outmoded because war was an old-fashioned way of gaining wealth. With the new ways of trade and productivity and industry, there would be an international economy without the political coercion necessary to achieve what had been done before. So economics, so to speak, was given its head, and even when at the end of the century we saw overt imperialism and the carving up of Africa, that imperialism was not, if I read the evidence correctly, primarily economic, but political; the atavisms, if you will, of old Europe.

Today we have an international economy, but the political units are national political units; and the relationships are unstable. We have centrifugal and centripetal forces. We have an international economy, but also a new international division of labour which is re-making and re-working the entire world economy.

There is, first, a geographical shift. Asia is the focal area in which the economic power becomes central — from Japan down through Korea, Singapore, Hongkong and China. In a more diffuse way, we also see that the old manufacturing that had been the basis of Western industrial power (shoes, textiles, clothing, shipbuilding, steel) are all being pulled out of the Western world, somewhat by market forces, somewhat for political reasons. We see the demand at the U[illegible] and UNCTAD for a new international economic order (set forth in Nairobi and Lima) in which 25 per cent of the world's manufacturing would be in the hands of the developing countries by the year 2000. The Western societies face huge problems of industrial dislocation: problems of an automobile industry which, on a world economic scale, may only be able to support eight companies; of steel which

becomes uneconomic in the UK and even in the United States; of shipbuilding, which in the UK today is subsidised to the extent of 70 per cent of its capacity; and so on.

The one element which remains as an offset for the West, its own comparative advantage, is high technology. Central to that is communications technology or the 'télématique' type of technology, the micro-processers as well as the transmission networks.

We have the growth of an international economy and even international economic institutions, such as the EEC, the International Monetary Fund, the World Bank, the OECD, the Council of Europe and OPEC. We have some cultural and scientific organisations such as UNESCO and the World Health Organisation. But we have no large-scale effective political units. The United Nations has no power, and diminished moral authority. There are military alliances, NATO versus the Warsaw Pact. But the efforts toward regionalism have largely failed: the African movements, the early hope of people such as Nkrumah, have now almost disappeared; a regional Latin American federation is still a chimera.

Yet more and more transactions take place on an international scale. One of the potent symbols is the Reuters money market service which links up in real-time quotations in Tokyo, Hongkong, Singapore, Milan, London, Paris, Frankfurt and New York so that the treasurers of banks and international corporations can take advantage of the differences in rates through arbitrage and move their money about. The potential for more and more instability increases as communications, by enlarging the scale, makes it more difficult to control such financial movements.

At the same time, we begin to see centripetal movements. People resent the enlargements of powers. They feel alienated. Therefore we see a process of sub-national fragmentation. It is fearful to read through the long list one could assemble of countries threatened by such fragmentation, whether it be Spain with the Basques and Catalans; France with the Bretons and Corsicans; the UK with the Scots and the Welsh and the Northern Ireland question; Belgium with the Walloons and the Flemish; the numerous countries in Asia where linguistic and communal fragmentation threatens; Africa, where tribal identifications cut across national lives; Canada, with the Francophone and the English-speaking groups in conflict; and so on.

We have here a double process in which the political units are fragmenting while the economic units are being welded together in larger

and larger rings. This process is reinforced by a crosscutting problem; namely, the shift from the market to political decision-making so that the political arena becomes the cockpit for the claimants of the state budgets who seek larger shares and allocation of monies and privilege in each society.

In this widest microcosm, we have a situation in which we are still organised politically as national states, large and small, and yet the entire world economy is changing so rapidly that the historians of the twenty first century will remark upon about that rapidity compared to previous such changes. I come to one conclusion, perhaps a little too facile, and yet a starting point for a necessary discussion; namely, if one looks at the variety of problems which are now handled by a national state (because of the shift in the market to political decision-making), and looks at the international arena, *then the national state has become too big for the small problems of life and too small for the big problems of life.*

The problem, sociologically, for the end of this century and the next is the matching of scales. What is the proper size and scope of the appropriate social unit to handle what kind of problem? The United States, the country I know best, is organised on a system of states and counties. There are 50 states, such as Connecticut, Rhode Island and Delaware, whose size makes little sense; they are quite tiny. And then there is Texas. If one were to go from El Paso in the South to Texarkana in the North, the distance within Texas alone is as great as from Brussels to Moscow. There are three thousand counties of the United States, laid out, particularly in the Mid West, usually on a 25 mile square grid, so that any person could go from any one part of the county to the county seat, where the courthouse was located, in one day, by horse and buggy. Clearly they do not match present realities. They are administratively gross, costly, and difficult to manage.

At the other extreme, there is the possibility that Lord Birkenhead raised, where, because of television and interactive media, we could have 'direct democracy', whereby individuals would be able to vote directly on any issue, creating instant plebiscites. For years the followers of Rousseau yearned for pure democracy and regretted the fact that size alone stopped us from achieving it. Now one can have pure democracy and referenda as agains. the 'manipulative systems' of party and representational democracy. Do we want the blessings of a national town meeting? I don't think I do. Such a system would only accentuate the volatility and moods of people, increase the anxieties

of the moment, and diminish the time for reflection. To be subject to the instant moods of the moment lends itself more than any other to demagoguery and manipulation more cruelly than any other kind of 'manipulation', such as those through party systems or elected representatives. And yet this is one of the options that lie before us.

The fundamental fact obvious to anybody who reflects about the new communications technology is that it has extraordinary potential either for the more intensive centralisation of power, because of the ability to have information flow to a centre (what in military parlance are called command and control systems), or for decentralisation whereby one could break up large units of industry. To some extent I think the technology of the future will break up industry, because the vertical integration which coordinates men, materials and markets is really a feature of industrial society. The modern corporation itself is very new. Business is as old as human civilisation; but the modern corporation is a social invention of the early part of the twentieth century. Vertical integration which is its main feature, whether it be in US Steel, Exxon or some of the others, is derived from an economy of scale and the desire to reduce the costs of transactions. Information flows within the corporation will change with the new communications technology.

The point at stake, however, is the potentialities. There's an old Russian witticism that asked 'Who was Stalin?' The answer: 'Stalin is Genghis Khan with a telephone at one end'. Think of how that power could be enhanced now with the new communication media. We saw in the Vietnam war the extraordinary situation whereby, because of the instantaneity of communication and the degree of command and control systems, field decisions, such as bombing, were taken not by the commander of the field but in the White House situation room.

All this, it seems to me, poses the most fundamental sociological problem for society. Communications technology produces a whole new set of scale effects. It increases the number of actors who participate in actions, and it increases the number of interactions. It also widens the arena in which actions take place. And it accomplishes these effects in real time.

All this brings most acutely to the fore the traditional issues of political philosophy: what kind of institutions can best meet the kinds of values that people want, to be able to express those needs most freely and fully? And we can only begin to match the sociological and political issues of scale when we understand what the revolution in

communications technology portends.

What is the proper size and scope of the appropriate social unit to handle the kind of problem that societies themselves have to confront? That is the issue I pose by my discussion of the matching of scales.